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Authors of papers intended for publication in Food Technology should request from the Editor's office a copy of a booklet, titled "Suggestions to Authors," and see that their papers are in the form specified therein before they are sent to the editor.

The Institute of Food Technologists assumes no responsibility for statements in contributed articles appearing in Food Technology. Editorials present only opinions of the writers and do not necessarily reflect policies of the Institute of Food Technologists.

Selected Abstracts

ANALYTICAL METHODS

226I. Determination of small amounts of oxygen in gases.

BRADY, L. J. *Anal. Chem., 20,* 1033-7 (1948).

The method is based on the oxidation by oxygen of the red reduced form of an alkaline solution of sodium anthraquinone β-sulfonate. The oxidized form is colorless. The oxidation and reduction of the reagent are reversible.

227I. Determination of nitrogen in organic materials.

HINDIN, S. G., AND GROSSE, A. V. *Anal. Chem., 20,* 1019-22 (1948).

Nitrogen in organic materials is customarily determined by either a Kjeldahl or a Dumas procedure. With the increasing usage of the mass spectrometer as a laboratory tool, isotopic methods of elemental chemical analysis have been suggested. A modification of the Dumas combustion in which the gaseous products are analyzed by the mass spectrometer, and an inert gas is used as an internal standard, is proposed. Though the method is still in a developmental state, the application of this type of analysis may be of interest in other fields, particularly in the determination of trace amounts of elements. RGM

228I. The separation of sugars.

FELLENBERG, T. V. *Mitt. Geb. Lebensmittel. Hyg., 38,* 265-91 (1947). French summary; *Nutr. Abst. Rev. 18,* 16 (1948).

After a study of methods for analyzing mixtures of sugars, details are given for the procedure recommended. Direct reduction and use of the volume method of Hadorn and von Fellenberg (Title 2489, Vol. 16) gives glucose, fructose, lactose and maltose. Glucose and fructose are estimated by using Barfoed's solution. Aldoses are estimated by oxidation with alkaline I solution, acidification and titration of the excess I. Fructose is estimated after oxidation of the aldoses. The first and last two estimations are repeated after weak acid inversion. Illustrations are given of the technique as applied to foodstuffs.

229I. Milk fat in milk chocolate.

FERRIS, L. W. *Assn. Off. Agr. Chem., 31,* 728-31 (1948).

One or two dioxane extractions in addition to the A. O. A. C. ether extractions are claimed to improve the yield of milk fat from milk chocolate.

230I. Test paper of urease and acid-base indicator for detection of urea.

COOK, J. W. *Assn. Off. Agr. Chem., 41,* 797-9 (1948).

Urease and brom thymol blue are combined in a dry test paper said to be extremely sensitive to urea as in urine contaminated products.

BIOLOGICAL SCIENCES

BIOCHEMISTRY

231I. On two micro-methods after Linderstrom-Lang and coworkers.

THOMAS, J. B. *Chron. Naturae, 104,* 89-91 (1948); *Nutr. Abst. Rev., 18,* 283, No. 1641 (1948).

This is a brief review of two methods for estimation of enzyme activity. The first method, dilatometric, involves the measurement of changes in the specific gravity of a drop of reagent held in a liquid mixture in which there is a specific gravity gradient. The second method, gasometric, depends on the measurement of pressure changes in a modified type of Cartesian diver.

232I. The estimation of peroxidase activity.

ETTORI, J. *Biochem. J., 44,* 35-6 (1949).

The methods for the determination of peroxidase activity based upon the catalyzed oxidation of pyrogallol to purpurogallin by hydrogen peroxide have been re-examined. The effects of varying concentration of reactants and of phosphate buffer have been investigated with a view to the development of a method giving more reproducible results. A manometric method, based upon the evolution of CO_2 during the oxidation, has been devised which gives results in good agreement with more recent methods involving colorimetric determination of purpurogallin. It thus becomes possible to express the activity of peroxidase preparations in terms of Q_{CO_2}. The periodic fluctuations in apparent peroxidase activity of enzyme preparation, the origin of which still remains obscure, have been confirmed.

233I. The activation of urease.

HOFSTEE, B. H. *J. Gen. Physiol., 32,* 339-49 (1949).

Activity of twice crystallized urease is reversibly increased by moderate heating and reversibly decreased by storage in the cold, even in the frozen state. Crude extract of jack bean meal containing potent urease undergo the same changes in activity. Dilution has the same effect as moderate heating. Activity of material stored 24 hr. at —10° C. can be increased fivefold by heating for 5 min. at 60°C. An association between urease molecules or between urease and other proteins occurs which results in inactivation but which is reversed on dissociation.

234I. The degradation of potato starch by pancreatic amylase.

BLOM, J., AND SCHMITH, T. *Acta. Chem. Scand., 1* (2), 230-2 (1947); *Biol. Abst., 22,* 2331, No. 23161 (1948).

While it was generally assumed that the fermentable sugar formed by the action of the pancreatic amylase on starch was maltose, the authors concluded from their work that considerable quantities of fermentable oligosaccharides were formed which had lower reducing power and higher specific rotation than maltose.

NUTRITION

235I. Vitamin C requirement of human adults. Vitamin C deprivation in man. Vitamin C Sub-Committee of Accessory Food Factors Committee, Medical Research Council, Preliminary Report.

LANCET, *254,* 853-8 (1948); *Brit. Abst. AIII,* 1173 (1948).

Nineteen men and one woman, aged 21-34, volunteered for the experiment. The food was selected and cooked so that the average intake was not more than 1 mg. of ascorbic acid daily. After a preliminary period of 6 weeks on a complete diet containing 70 mg. of vitamin C per day, ten of the volunteers received no supplement, seven received 10 mg. daily, and three received 70 mg. of C daily. The minimum protective dose is approximately 10 mg. per day. Thirty mg. per day is a safe daily intake.

236I. The value of urea in protein supplements for cattle and sheep.

DINNING, J. S., BRIGGS, H. M., AND GALLUP, W. D. *J. Animal Sci., 8,* 24-33, Feb., 1949.

Nitrogen retention by steers and lambs on each type of ration was increased by the additional nitrogen supplied by urea in the supplements. The 50% urea-nitrogen supplement was as efficient as the 25% supplement in promoting these retentions. There were feed refusals by steers, however, when the 50% supplement was fed in wintering rations. Lambs appeared to be more efficient than the steers in utilizing urea nitrogen. The apparent digestibility of ration nutrients other than protein (N X 6.25) was unaffected by urea. Feeding the 25% urea-nitrogen supplement at less frequent intervals; on alternate days as compared to daily and twice daily, had no effect on urea utilization by steers. No ammonia could be detected in the expired air of steers following the feeding of urea.

237I. The role of the time factor in feeding supplementary proteins.

GEIGER, E. *J. Nutrition, 36,* 813-19 (1948).

The problem of differential supplementation of proteins in young growing rats was investigated. Yeast, blood and wheat gluten do not promote growth when fed individually at a 90%

(Abstracts, continued on page 10 following technical papers)

INDUSTRIAL ENZYMES

Which of These Will Improve Your Products?

Enzyme System	Designation	Availability	Action on Substrate
Pectinolytic	PECTINOL	Commercial	Demethoxylates pectic substances and hydrolyzes them to galacturonic acid. pH range 3.5 - 5.
	Pectin esterase	Experimental	Demethoxylates pectin without hydrolysis of the galacturonic acid chain. pH range 3.5 - 5.
Proteolytic	RHOZYME P-11	Commercial	Hydrolyze proteins to peptides and amino acids. pH ranges 5.5 - 8.5. (Relative amounts of peptides and amino acids will differ for each proteolytic enzyme.)
	Protease 15	Experimental	
	Protease 16	Experimental	
Amylolytic	RHOZYME S	Commercial	Hydrolysis of starch to dextrins, maltose and glucose. Contain both an alpha amylase and a strong glucogenic principle. pH range 5 - 6. RHOZYME S is a purified enzyme; RHOZYME T-22 the crude product.
	RHOZYME T-22	Commercial	
	RHOZYME DX	Commercial	Hydrolysis of starch to dextrins. Heat stable. pH range 5.5 - 6.5.
Lipolytic	Lipase A	Experimental	Hydrolysis of fats to glycerin and fatty acids. pH range 5 - 7.
Lactase	Lactase A	Experimental	Hydrolysis of lactose to glucose and galactose. pH range 6.1 - 7.5.

Commercially available Rohm & Haas enzymes are being used *now* in the following industries:—Fruit juices, jellies and fruit juice concentrates, protein hydrolysates, baking, corn starch industries, fermentation. Have you stopped to think how these materials might improve your product or manufacturing process?

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News of the Institute

HONORS

NICHOLAS APPERT AWARD

Dr. Roy C. Newton of Chicago, Vice President of Swift and Company, in charge of research, was awarded the Nicholas Appert Medal by the Institute of Food Technologists at the Annual Convention in San Francisco, California, on July 12.

Dr. Newton is an outstanding scientist, administrator, and leader in research, particularly in the field of fats and oils. He is a past national president of the Institute of Food Technologists and is active not only in the Institute but also in the American Chemical Society, the Industrial Research Institute, the American Oil Chemists' Society, the George Washington Carver Foundation, the Nutrition Foundation, and the National Research Council.

STEPHEN M. BABCOCK AWARD

Clarence Birdseye of Gloucester, Mass., received on July 11, at the Annual Convention of I.F.T., the 1949 Stephen M. Babcock Award of the Institute. This award, made possible by an annual grant of one thousand dollars from the Nutrition Foundation, is given each year to some scientist who has made contributions to food technology that have passed into industrial use on a large scale and so have improved nutrition in the United States and Canada. Birdseye pioneered the quick freezing of seafoods, fruits, and vegetables.

NATIONAL LIVE STOCK AND MEAT BOARD AWARD

Dr. C. A. Elvehjem of the University of Wisconsin, whose achievements in the field of research have won for him national and international distinction, was signally honored at the recent annual meeting of the National Live Stock and Meat Board.

C. A. ELVEHJEM

He was presented an award which was in recognition of his contribution to the science of biochemistry and his leadership in the field of nutrition.

High tribute was paid to Dr. Elvehjem as a leader in research by Dr. Charles E. Friley, president of Iowa State College. Dr. Friley referred to him as truly a native son of Wisconsin, having not only been born in the state but having made a splendid record and built a fine career almost entirely within the confines of that state.

The speaker pointed out that the researches in nutrition which have been carried out by Elvehjem and his associates at the University of Wisconsin have become world famous, and that it would be impossible to even briefly digest the tremendous number of experiments, reports and accomplishments which have originated with Dr. Elvehjem and his group. He cited outstanding examples of success achieved through brilliantly planned research which has been a long step forward in the betterment of the public health.

The Board has placed several research grants at the University of Wisconsin in support of studies which have been carried on under the direction of Dr. Elvehjem. It was said that his findings have broadened the knowledge of the nutritive value of meat and have contributed immeasurably to the subject of nutrition.

Dr. Elvehjem was the recipient of the Nicholas Appert Medal in 1948.

FOOD INDUSTRIES AWARD

The Florida Citrus Canners Cooperative, Lake Wales, Fla., was presented on July 11 with the second biennial award of Food Industries magazine. In the 1949 competition, eleven processes in eight different fields of food technology were submitted for consideration to a jury composed of twenty-six I.F.T. members headed by Dr. Samuel C. Prescott, Dean Emeritus of Science at the Massachusetts Institute of Technology. The award was presented to the Florida Citrus Canners Cooperative for their frozen concentrated citrus juice process.

COMMITTEE ORGANIZATION

Institute of Food Technologists 1950 Conference

Chicago, Ill., Sunday, May 21 — Thursday, May 25, 1950

President of the Institute

National Publicity Committee

National Program Committee
Vice Chrm. L. A. Hall

Local Arrangements
All Local Matters
Genl. Chrm. C. L. Smith
Vice Chrm. R. A. Isker

Exhibits
Chairman L. E. Clifcorn
Solicit Exhibits
Assign Space
Supervise Exhibits

Local Publicity and Printing
Chairman M. E. Parker
All Printing—Program, Badges, Tickets, etc.
Local Publicity
Coop. with Natl. Pub.

Registration
Chairman R. D. Trelease
Advance and Current Registration
Distributing Tickets
Maintain Message Center

Budget and Finance
Chairman R. N. Schaffner
Prepare Budget
Establish Accounts
Supervise All Expense
Receive and Disburse Funds

Hotel Arrangements
Chairman E. S. Stateler
Reservations and Rooms
Banquets and Lunches
Meeting Rooms and Necessary Equipment

Entertainment
Chairman M. L. Laing
Vice Chairman D. A. Huber
Banquet and All Special Entertainment
Ladies' Entertainment

(News of the Institute continued on page 9 following technical papers)

Industrial and Legal Viewpoints

Functions of An Industrial Fisheries Laboratory

CHARLES H. SHACKELFORD

National Fish Department, The Great Atlantic & Pacific Tea Company, 151 Northern Avenue, Boston, Mass.

In this discussion of the functions of an industrial fisheries laboratory is information of interest to all food technologists concerned with quality control and research in food technology.

A typical industrial fisheries laboratory is not unlike the average research and control laboratory serving the vegetable, meat, dairy and other food industries. The fisheries laboratory has its bacteriological, chemical and physical testing sections and usually a modern well-equipped test kitchen. Among its activities are included (1) Establishment and maintenance of good sanitation in the processing and handling of fisheries products, (2) Quality Control and (3) Research and Development.

Sanitation is a responsibility of every individual employed by the industry. The laboratory, however, with its technically trained staff and facilities is able to approach the problems of sanitation scientifically. It is the responsibility of the laboratory to establish sanitary operating procedures and to insure their follow-through by means of frequent inspections. Sanitary procedures are far more effectively exercised if the person or persons responsible for a cleaning or sanitizing job realize the significance of such work. The laboratory can go far in the education of these persons to the prime necessity for good sanitation. Round-table discussions coupled with demonstrations will stimulate interest and give employees a new perspective in their work.

Quality control over fisheries products commences when the fish or shellfish are removed from their natural habitat and does not end until the finished product is finally consumed. A most important phase of quality control comprises the laboratory examination of the finished product. This examination normally includes (1) packaging efficiency, (2) weight control, (3) chemical and bacteriological analysis and (4) palatability testing. Analytical methods employed vary widely depending upon the nature of the product. There are no entirely satisfactory chemical or bacteriological tests for determining the quality of fresh and frozen fish fillets. The most satisfactory method available is organoleptic examination of the raw and the cooked fish. The examination is conducted by a taste panel composed of experts who have been chosen for their taste sensitivity and ability to reproduce results. Scoring or grading systems are based on arbitrary scales.

On the other hand, proper quality evaluation of certain other seafoods would be practically impossible without the aid of specialized chemical and bacteriological analytical methods. These foods include fresh and frozen oysters, soft shell clams, quahaugs, lobster meat, crabmeat and precooked frozen seafoods. Quality standards are established and maintained by the laboratory consistent with highest quality obtainable under practical efficient operation.

The industrial fisheries laboratory carries on very little research of a basic or fundamental nature. Such research is effectively conducted by colleges, universities and governmental agencies such as the United States Fish and Wildlife Service. The results of this basic research are made available to industry which, in turn, applies them to its every-day problems in sanitation, processing, packaging, etc.

A most vital and interesting problem in applied research currently under investigation by a number of fisheries laboratories is the application of antioxidants to fatty fish for the purpose of retarding the rancidity and browning which develop during storage of the frozen fillets. Research to date has established the effectiveness of such chemicals as Ascorbic Acid and NDGA as antioxidants for use on Mackerel and Salmon fillets. For these varieties shelf life extensions from 100 to 300% appear feasible depending upon type of antioxidant employed, concentration, mode of application, etc. Recent research has shown that certain water-soluble antioxidants such as Ascorbic Acid can be made more effective by incorporating a wetting agent in the dipping solution. The resulting reduced interfacial tension between the fat particles and the antioxidant solution presumably accounts for the increased efficiency. Oil soluble antioxidants such as NDGA heretofore only applicable in solutions of vegetable or mineral oils may be solubilized in aqueous solution by incorporation of a special type of wetting agent.

The fisheries laboratory research staff are constantly engaged in product improvement research and new product development. Here the technologist works closely with the merchandising, operating, production and cost departments until an original idea evolves itself into a new product or an improvement in an existing one. New products often require specialized processing techniques, different types of packaging, a different method of handling. These are a few of the problems that confront the laboratory research staff.

Fresh crabmeat is a fine example of a laboratory quality-controlled commodity. The crabmeat industry referred to is not the small local crab industry of New England but rather the commercially significant industry of Southern Atlantic waters centered in Maryland and Virginia on the Chesapeake Bay and in smaller bays and inlets along the Carolina and Georgia coasts. The commercial crab of these waters is the Blue Crab *(Calinectes sapidus)*. The industry is by and large seasonal, commencing in May and continuing through the summer and on into September. The majority of crab

plants are also oyster shucking plants handling oysters during the cold winter months and changing over to crabmeat packing during the summer. The State of Maryland is unique in having a conservation law prohibiting the taking of Blue Crabs during the winter months. Such far-sighted measures have proven effective in maintaining a continuing supply of crabs in heavily fished areas in the heart of the industry. Other states will undoubtedly follow Maryland's fine example and establish certain closed seasons for the protection of this delectable seafood.

For those readers who are not familiar with the methods of taking, handling and processing of crabs for the market, a brief resumé is in order. The principal method of fishing crabs during summer months is by the "trot-line." In brief, this consists of a line 1,000 ft. or more in length baited at intervals of about 5 feet with tripe, eels, etc. During winter months when crabs lie inactive on the bottom they are not attracted by bait and consequently must be caught through the use of a dredge. The crabs are kept alive by the fisherman until delivered to the crab plant. Here they are cooked by means of either boiling water or steam under pressure, the latter method predominating in the industry today. The cooked crabs are transferred to sanitary cooling platforms for air cooling and thence to the picking rooms. Here the meat is removed from the shell by deft workers who segregate it according to grade (regular, claw or backfin) as it is removed and packed directly into 8 oz. and 1 lb. tins. The packed tins are thence packed in crushed or flake ice in barrels in preparation for shipment to distribution centers.

The visual quality of crabmeat depends a good deal upon the individual skill and fastidiousness of the picker. An overabundance of shell and mashed or broken pieces of meat reduce the quality of the crabmeat and are the result of unskilled or careless workmanship on the part of the picker.

The bacteriological picture, however, is of the greatest importance in evaluating the quality of crabmeat. If the initial bacterial load is excessively high, crabmeat of excellent appearance, flavor and odor may be predestined to spoil and become putrid in as short a time as a day or two after packing even under favorable storage conditions at 32 to 40° F. Crabmeat spoilage is of public health significance and of great economic importance by virtue of losses incurred in this costly commodity. Also of great public health significance is the contamination of the meat with fecal matter. Evidence of pollution in crabmeat can usually be traced directly to cases of lax personal cleanliness and improper supervision. The necessity for ample sanitary measures in the industry is particularly obvious when one considers that crabmeat is a fresh, highly-perishable commodity ready for consumption as packaged without benefit of further heat processing or sterilizing treatment.

The majority of crab plants are relatively small, some producing as little as a few thousand pounds of meat in a season, and for this reason large companies handling hundreds of thousands of pounds yearly must depend upon many of these small packers to satisfy their requirements.

Laboratory control commences at the point of production. Extensive sanitary inspections are conducted periodically by a member of the laboratory staff. The individual packers are instructed in latest sanitary operating procedures and in sanitary plant construction. Such contacts serve to screen out poor packers who are either unable or unwilling to produce a product consistent with a packer's quality standards.

The next and all-important phase of the laboratory control is the actual analysis of finished products. The analysis consists of (1) Check-weighing for compliance with minimum weight standards, (2) pH determination, (3) Nessler's reaction, (4) E. coli incidence, (5) Total bacteria count and (6) Organoleptic examination for appearance, texture, flavor and odor. From time to time additional analytical methods are employed, as for example, (1) determination of pieces of shell per unit weight and (2) determination of percent total solids. The latter test is employed if it is felt that a particular packer is excessively washing his crabmeat. Cooked crabmeat will absorb considerable quantities of fresh water or light brine on prolonged contact with a resultant decrease in percent total solids.

A total bacteria count by itself is not necessarily indicative of poor sanitation at point of production, neither is it always indicative of incipient spoilage. It may indicate either one or a combination of both of these factors. For instance, perfectly fresh crabmeat at point of production may have a terrific bacterial load due wholly to unsanitary conditions causing contamination of the meat. Conversely, meat prepared under ideal sanitary conditions with a low initial bacterial load may result in excessively high bacteria count in a day or two as the result of improper refrigeration. Accordingly, an intelligent appraisal of the quality and sanitary history of any given lot of crabmeat can be attained only by integration of all analytical data. The pH of the crabmeat is of some significance and rises proportionately with an increase in ammonia and amine bases resulting from the proteolytic action of bacteria. The Nessler's reaction is also indicative of ammonia and amine bases and is perhaps of more significance than pH since the correlation is not influenced so much by buffering action of free acids formed during decomposition. High pH and Nessler's reaction coupled with high bacteria count generally indicate incipient spoilage whereas low pH and Nessler's reaction coupled with high bacteria count are generally indicative of excessive bacterial contamination during processing or handling as the result of poor sanitation.

Presence of E. coli in crabmeat indicates fecal contamination. Its incidence serves as a measure of employee personal cleanliness and also effectiveness of vermin and insect control.

It has been the intent of this paper to familiarize food technologists with the general workings of a typical industrial fisheries laboratory and to show him how the laboratory organization works with management in the interests of better quality seafoods.

News of the Institute

(Continued from page 6 preceding technical papers)

Transportation and Field Trips

Chairman V. O. Wodicka
All Field Trips
Special Local Transportation
Transportation to Chicago

Courtesy

Chairman W. D. Shannon
General Information Service
Monitor Service
Special Guests
Special Duties

GEOGRAPHICAL DISTRIBUTION OF MEMBERSHIP

A compilation, as of June 24, 1949, by Secretary Fellers, gives the following interesting information in regard to the geographical distribution of membership in the Institute of Food Technologists:

Maine	13	Minnesota	50
New Hampshire	1	Iowa	27
Vermont	5	Missouri	55
Massachusetts	160	North Dakota	0
Rhode Island	6	South Dakota	0
Connecticut	18	Nebraska	10
New England	203	Kansas	10
		West No. Central	152
New York	388		
New Jersey	231	Arkansas	5
Pennsylvania	131	Louisiana	9
Middle Atlantic	750	Oklahoma	0
		Texas	22
Delaware	9	West So. Central	36
Maryland	90		
Dist. of Columbia	22	Montana	2
Virginia	13	Idaho	2
West Virginia	2	Wyoming	0
North Carolina	6	Colorado	8
South Carolina	5	New Mexico	2
Georgia	23	Arizona	1
Florida	59	Utah	4
South Atlantic	229	Nevada	0
		Mountain	19
Ohio	76	Washington	74
Indiana	32	Oregon	56
Illinois	429	California	490
Michigan	70	Pacific	620
Wisconsin	61		
East No. Central	668	Hawaii	6
		Alaska	1
Kentucky	7	United States Total	2,707
Tennessee	9		
Alabama	3	Mexico	6
Mississippi	4	Canada	83
East So. Central	23	Other countries	77
		Outside U. S.	166
		Grand Total	2,873

Regional Section News

NORTHERN CALIFORNIA SECTION

At a meeting of the Executive Committee on May 19, it was announced that E. A. Seipp of Golden State Co. and a former member of the Chicago Section of I. F. T. has become a member of the Northern California Section. In addition, the following applications for membership were approved:

R. D. Armstrong, The Welch Grape Juice Co.
Henry Ball, F. M. Ball & Co.
T. D. Barlow, The Barlow Co.
H. M. Buley, S & W Fine Foods, Inc.
B. J. Butler, Atlas Pacific Eng. Co.
Alice R. Collings, Western Regional Research Laboratory
J. C. Connell, American Can Co.
Dave Eolkin, Gerber Products Co.
E. W. Flavell, Holly Sugar Corp.
L. F. Jents, Doughnut Corp. of America
A. A. Klose, Western Regional Research Laboratory
T. M. Lukes, Student
R. D. Mathews, S & W Fine Foods, Inc.
B. E. Monroe, Standard Brands, Inc.
J. J. O'Connell, Silveira & O'Connell
C. F. Pinney, Langendorf United Bakeries, Inc.

On June 23, a Section meeting was held to acquaint the membership with the accomplishments and objectives of the various committees of the 1949 National Convention. At this meeting the following applications for membership in the Section were approved:

John M. Leavitt, James Q. Leavitt Co., Oakland
Gault Davis, International Minerals & Chemical Corp.
Luis de Alcuaz, Gerber Products Co., Oakland
Edwin S. Doyle, N. C. A., Western Branch Lab., San Francisco
Milton P. Duffy, Bureau Food and Drug Inspection, State of California
James F. Duncan, Golden State Co., Ltd., San Francisco
Frederick G. Eis, Spreckels Sugar Co., Woodland, Calif.
James W. Joyce, Workman Packing Co., San Francisco
Hugh C. Landes, San Francisco
F. E. Lindquist, Western Regional Research Lab., Albany, Calif.
Benjamin Makower, Western Regional Research Lab., Albany, Calif.
Irwin Martin, Wm. J. Stange Co., Oakland
George E. Mauer, Chas. Pfizer & Co., Inc., San Francisco
Herman J. Morris, Western Regional Research Lab., Albany, Calif.
Louis J. Nava, Golden State Co., Ltd., San Francisco
Joy S. Neidlinger, Golden State Co., Ltd., San Francisco
Henry Louis Roux, Marlboro Beverage Co., San Francisco
Doris M. Tilden, Federal Food and Drug Adm., San Francisco
Graham Vernig, John Bean-Food Machinery and Chem., San Jose

Lyman M. Cash, formerly chemist of the Italian Swiss Colony, is now working for Gallo Winery.

R. O. Thompson, formerly with Goble Disc Works of Fowler, has joined the Pacific Olive Co. of Visalia as a partner. Other partners who retain a majority ownership and an active interest in the Company are Edward Van Dellen and Richard N. Ball.

SOUTHERN CALIFORNIA SECTION

Dr. Philip K. Bates, formerly Director of Rexall's Product Development Department, has been elected President of the Cabot Chemical Company, a newly formed, independent subsidiary of Rexall Drug, Inc. The new company will have its own research, sales, and merchandising operations and will be responsible for the development of ethical pharmaceutical specialties. The offices will be in Los Angeles.

ST. LOUIS SECTION

On May 25, the St. Louis Section elected the following officers for 1949-50:

Chairman: Frederick A. Linde, Monsanto Chemical Co., 1700 South Second St., St. Louis 4, Mo.
Vice-Chairman: J. M. Blatterman, Warner Jenkinson Mfg. Co., 2526 Baldwin, St. Louis 3, Mo.
Secretary-Treasurer: Bonnie Britt, Ralston Purina Co., 835 South 8th St., St. Louis 2, Mo.
Councilor: Eugene V. Nay, St. Louis Brewer's Yeast Corp., 1514 North 13th St., St. Louis 6, Mo.

Executive Committee: Addison Y. Finkelnburg, Blanke-Baer Extract & Preserving Co., 3224 South Kingshighway, St. Louis, Mo.; Henry Peplies, Griesedieck Western Brewing Co., 1201 W. East St., Belleville, Ill.; Ulysses C. Gramsch, Falstaff Brewing Co., 3617 Olive St., St. Louis 8, Mo.; Nicholas Ferraez, Jr., St. Louis Dairy, 2001 Chestnut St., St. Louis 3, Mo.; Alexander F. Bucholtz (ex officio), Sicks' Brewing & Malting Co., 3100 Airport Way, Seattle 4, Washington.

NEW YORK SECTION

On May 25, officers of the New York Section for the coming year were elected as follows:

Chairman: Ira D. Garard, Department of Chemistry, New Jersey College for Women, New Brunswick, N. J.
Vice-Chairman: Stephen L. Galvin, The Huron Milling Co., New York 7, N. Y.
Secretary: Albert A. Schaal, Good Housekeeping Bureau, New York, N. Y.
Treasurer: Philip Kraatz, Hoffman Beverages.

GREAT LAKES SECTION

C. Olin Ball, Editor of FOOD TECHNOLOGY, left Ohio in July to do research work in food technology at Rutgers University and to carry on his outside consulting work simultaneously. He plans to operate his laboratory in New Brunswick, N. J., under the name of "Food and Container Research Laboratories."

MARYLAND SECTION

The Maryland Section held the final meeting of the season on June 10, in Baltimore. Following the dinner and business meeting, Dr. John C. Krantz of the University of Maryland Medical School, Baltimore, spoke on "If Sugar Burns, or the Metabolism of Carbohydrates."

PUGET SOUND SECTION

At the Annual Meeting of the Puget Sound Section in Seattle, Washington, on May 26, Dr. Edward Ross, Associate Professor of Horticulture at Washington State College, Pullman, Washington, spoke on "The Uses of High Frequency Radio Power in Food Processing."

Officers for the coming year were elected as follows:

Chairman: Howard C. Douglas, University of Washington, Seattle 5, Washington.
Vice-Chairman: James C. Palmer, U. S. Food and Drug Administration, 501 Federal Office Bldg., Seattle, Washington.
Secretary: Max Patashnik, Libby, McNeill & Libby, Seattle 4, Washington.
Treasurer: Arthur J. King, Fisher Flouring Mills Co., Seattle 4, Washington.
National Councilor: William L. Haley, Fisher Flouring Mills Co., Seattle 4, Washington.
Executive Committee for 2 years: Clarence W. Hurlbut, Blue Banner Foods, Kent, Washington.
Executive Committee for 1 year: Robert L. McDonald, Frozen Food Division, Deming and Gould Co., Seattle 1, Washington; Francis P. Owens, Laucks Laboratories, Inc., Seattle 4, Washington.

Clarence L. Anderson, Chairman of the Puget Sound Section during the past year, has resigned his position as Assistant Director of the State of Washington Department of Fisheries. On June 1, he became Director of the Department of Fisheries for the Territory of Alaska, with headquarters in Juneau.

CHICAGO SECTION

The June issue of *The Vitalizer* is dedicated to the hosts of the Ninth Annual I. F. T. Conference, the Northern California Section, and contains some interesting historical notes on the Northern California Section by W. V. Cruess.

M. C. Phillips, Vice President of The Griffith Laboratories, Inc., has recently become a member of I. F. T. He is a charter member of the American Society of Bakery Engineers and one of eight charter members who have maintained a perfect attendance record at the annual meetings for the 25 years since the organization was established.

Abstracts

(Continued from page 4 preceding technical papers)

protein level. Diets containing wheat gluten plus blood protein, or yeast plus blood protein, or yeast plus wheat gluten protein have satisfactory growth promoting qualities. If however, these same pairs of proteins are fed separately with lapses of time between feedings, they do not supplement each other, as is indicated by the lack of resulting growth.

238I. Effect of industrial heat treatment on the protein values of foods.

JACQUOT, R., MATET, J., AND FRIDENSON, O. *Ann. Nutrit. Alimentation*, 1,157-213 (1947). *Nutr. Abst. Rev. 18*, 35 (1948).

The effect of different types of heat treatment, e.g., autoclaving, high-temperature extraction, and dry heat, on foods is summarized. The results described are very variable. The effects on milk and milk products, cereals, peas, lentils, and cottonseed are in general unfavorable; biological value and in some cases digestibility is reduced. The effect on haricot and soya beans, on the other hand, is favorable, increasing the biological value, i.e. the available amino acids. In other materials, such as copra, sunflower seed, groundnuts, the effect is indefinite. In general, dry heat is the most harmful type of treatment; moist heat, e.g., autoclaving, often increases the biological value of food protein. An extensive bibliography is given.

239I. A synthetic milk ration for baby pigs.

LEHRER, W. P., JR. et al. *J. Animal Sci., 8*, 107-11, Feb. 1949.

Using growth and urinary B-vitamin excretion as criteria of adequacy, a synthetic milk for baby pigs was devised. The diet consisting of casein, cerelose, lard, mineral salts, supplemented with thiamine, riboflavin, nicotinic acid, inositol, choline, pyridoxine, calcium pantothenate, vitamin E, vitamins K, A, and B.

240I. The influence of soybean oil meal upon roughage digestion in cattle.

BURROUGHS, W., AND GERLAUGH, P. *J. Animal Sci., 8*, 3-7, Feb., 1949.

The dry matter digestion in corncobs and timothy hay was increased by 14% and 17% respectively, by the inclusion of soybean oil meal in the ration. These differences are of practical significance. In the case of corncobs, the beneficial influence of soybean oil meal was not sufficiently great to fully explain the divergent feedlot results on the value of cobs obtained by different investigators. It is possible that factors other than protein may have been responsible for the favorable influence of soybean oil meal upon corncob and timothy hay dry matter digestion.

FOOD PRODUCTS

CEREALS, GRAINS, AND FERMENTATION PRODUCTS

241I. Modern concepts of flour mill sanitation.

BUCKLEY, M. S. *Northw. Miller Milling Prod. Sect., 238,* 1a, April 12, 1949.

Plans given for thorough inspection. Selection of the proper formulation of insecticide in food plants should be based on (1) If the area to be sprayed is a non-porous surface like glass, metal, enameled surfaces, etc., an oil base spray may be used to a good advantage. (2) If the surface to be treated is porous, such as concrete, untreated wood or flat painted surfaces upon which water staining is not objectionable, then the water emulsion is the proper formulation to use. (3) If the surfaces are porous and the presence of a chalky residue is not objectionable, then the wettable powder may be used to a good advantage.

242I. Method of preparing an adhesive from cereal flour.

KESLER, C. C., AND HICKS, W. L. Assignors to Penick and Ford, Ltd., Inc. 2,466,172, April 5, 1949.

A method of preparing an adhesive from cereal flour, comprising mixing the cereal flour in water with an alkali to bring the pH to about 9-10, heating the material at a temperature about 130° F. to inactivate the naturally occurring enzymes in the flour, raising the temperature to about 170-210° F. to cook the starch, and adjusting the pH of the material within 5-7.

243I. Grain alcohol fermentations. Submerged mold amylase as a saccharifying agent.

LEMENSE, E. H. et al. *Ind. Eng. Chem., 41,* 100-3 (1949).

Experiments were conducted on a pilot plant scale by utilizing conventional distillery equipment and were designed to supply data on the following points: type and concentration of enzymes produced in submerged fermentation under varying rates of aeration, concentration and quantity of mold culture required to replace malt; alcohol yields obtainable by the continuous use of fungal amylase for the saccharification and fermentation of corn; and investment and operating costs for the production of fungal enzymes by the submerged process. Results showed that saccharification was satisfactory and alcohol yields were comparable to those obtained with malt when mold culture liquor equivalent to 6 to 10% of the final volume was used. The cost of the amylase is estimated to be 6.06 cents per bushel of grain processed, as compared with 12.1 cents in the case of malt.

244I. Gin flavorings.

JACOBS, M. B. *Am. Perf. 53,* 54-6, Jan., 1949.

American gin flavor is based chiefly on juniper and angelica; British gin flavor on juniper and coriander. Holland gin retains some of the grain flavor in the alcohol base; juniper is added. Gin is usually bottled as made, without aging.

COCOA PRODUCTS

245I. Cocoa seen as new field for soy.

BENNING, W. *Soybean Dig., 9,* 38, Jan., 1949.

Ground cocoa, deprived of its oil content, is mixed with a far greater percentage of ground soybean. With water added, it produced a drink like that of cocoa mixed with milk. It is found to be very nourishing and satisfying. The value of soy in cocoa lies in its high albumen content. Cocoa itself is deficient in albumen. The purpose of the soy is not to crowd out the milk chocolate but to furnish a very nourishing addition.

DEHYDRATED FOODS

246I. Method of dehydrating food products.

KELLOGG, J. L. Assignor to J. L. Kellogg & Co. 2,467,318. April 12, 1949.

The method of dehydrating organic cellular material which includes the steps of freezing the material so as to freeze the water content thereof and thereby expand the cellular structure of the material, and thereafter reducing the material to small particles and feeding them at a uniform rate into an air stream heated to approximately 350° F. wherein the frozen water content is quickly vaporized, while the material is in suspension and before the frozen water returns to the liquid phase, whereby the presence of ice crystals in the material together with the additional cooling effect due to quick evaporation, maintains the material relatively cool.

247I. The bacteriology of dehydrated vegetables.

RISHBETH, J. *J. Hyg., 45,* 33-45 (1947); *Nutr. Abst. Rev. 18,* 42 (1948).

An investigation into the causes and sources of bacterial contamination of cabbage, potato and carrot during commercial dehydration showed that the microflora was very varied, but potential pathogens other than *Bact. coli* were seldom encountered. Practical freedom from bacterial infection resulted from scalding, but subsequent passage over conveyors and exposed equipment greatly increased bacterial contamination. The final drying process caused some reduction of bacteria, except where uneven drying of cabbage resulted in bacterial multiplication. On storage bacteria normally died out, particularly at the higher temperature tested, and no growth of bacteria took place if the moisture content did not exceed 5% for cabbage and carrot and 8% for potato. Normal rehydration and cooking by the consumer destroy most of the bacteria, but prolonged soaking may result in souring.

The number of bacteria found in the products of different factories was largely influenced by their equipment. Suggestions are made for improvement in the design of factory dehydration plant.

In an attempt to evaluate the accuracy and reliability of the plate count technique it was found that considerable errors arose from the probably irregular distribution of bacteria throughout the bulk of the material examined and from imperfect distribution of bacteria in suspensions. Bacteria appeared to exist on the surface of vegetables only. Plate counts tended to be greater when suspensions were prepared at higher temperatures over the range 10° to 40° C. It was concluded that the plate count could be used with some confidence as a general guide to the state of factory hygiene.

248I. The effect of storage on the reducing power of dried potato products.

KRONER, W. *Vitamine u. Hormone, 4,* 173-81 (1943); *Nutr. Abst. Rev. 18,* 114 (1948).

The ascorbic acid content was estimated by indophenol titration in dried potato slices of 3 different varieties from 4 factories, in potato flakes, and in roller-dried potato powder. During about 6 months' storage at room temperature there was little loss of ascorbic acid from slices or powder, by the end of 8 to 10 months losses up to 50 percent of the original content were observed. The values for different varieties varied in different years and the stability of the vitamin appeared to vary also in different samples of the same variety. The loss from potato flakes was more marked than from other products. This was not serious from the point of view of human nutrition since flakes were usually given to animals which would obtain vitamin C from other sources. Storage at higher temperatures up to 32° C., caused a more rapid loss of vitamin C from potato products. In some samples, the apparent reducing value increased after prolonged storage at 32° C.

FATS AND OILS

249I. The keeping quality of elaidinated fats.

BERTRAM, S. H. *J. Am. Oil Chem. Soc., 26,* 83-5 (1949).

The causes of the considerably better keeping quality of elaidinated oils and fats have been investigated through the rate of peroxide formation. They are physical as well as chemical in nature. The more solid composition of elaidinated fats is the physical cause. Traces of selenium have been proved to behave as a strong antioxidation agent. The elimination of traces of metals in the course of the process of elaidination with Se also has a very favorable influence. The elaido configuration of the unsaturated acids, however, has been shown to be the principal factor in retarding oxidation.

250I. Phospholipoid carrier for antioxidant.

HALL, L. A. Assignor to the Griffith Laboratories, Inc. 2,464,928, Mar. 22, 1949.

The method of incorporating a normally substantially fat-insoluble gallic acid ester in a fatty material comprising the step of dissolving the ester in a relatively large proportion of molten lecithin and then introducing the molten solution to the fatty composition likewise in a molten state, and thoroughly mixing the materials.

251I. Antioxidant.

HALL, L. A., AND GERSHBEIN, L. L. Assignors to the Griffith Laboratories, Inc. 2,464,927, Mar. 22, 1949.

An antioxidant composition for fatty materials comprising a vegetable carrier oil and a synergistic mixture of a tocopherol, a low molecular weight alkyl ester of gallic acid, and lecithin.

FRUIT

252I. Fruit peeling and coring machine.

GROSS, A. C. 2,465,223, Mar. 22, 1949.

A machine for removing rinds from fruit comprising a frame, a driven rotary cutter supported by the frame, pairs of reciprocating hooks carried by the frame, spindles for insertion through the fruit and supported at their ends by the pairs of hooks, and means actuating the pairs of hooks for positioning the fruit against the driven rotary cutter.

253I. Machine for removing meat from shells.

SCHOENING, O. A. Assignor to Hawaiian Pineapple Co., Lt. 2,467,158, April 12, 1949.

An eradicator machine for removing a relatively soft layer of meat from a hard, tough, flexible shell comprising a conveyor having shell gripping means on a face thereof, a knife having a cutting edge extending transversely of the path of travel of the conveyor adjacent the shell gripping face thereof for severing meat from the shells carried by the conveyor, a grid disposed opposite the shell gripping face of the conveyor immediately in advance of knife and including a plurality of grid bars spaced laterally and extending longitudinally of the path of the conveyor and projecting toward the conveyor to penetrate the meat layer of the shells carried by the conveyor, means resiliently mounting the portion of grid adjacent said knife for yielding away from the conveyor under predetermined pressure of a shell on said grid bars, and means connecting knife to resiliently mounted grid portion for movement of the cutting edge of the knife toward and away from the conveyor in conformity with the movement of grid portion.

MEAT AND POULTRY

254I. Odor and taste tests of pork from animals sprayed with benzene hexachloride.

LEHRER, W. P., JR., BARR, W. F., AND MANIS, H. C. *J. Animal Sci., 18,* 141-3, Feb., 1949.

The majority of the testers considered the samples pleasing in taste and odor throughout the test period. This indicates that there is no off odor or taste in the meat of swine treated with benzene hexachloride for the control of mange or lice, when a water suspension spray is used two or more weeks before slaughter. Some individuals reported questionable odors and off flavors; however, this can be attributed to the variations in the taste of individuals and the fact that the meat samples were unseasoned. Since completion of this experiment, Grummer, Bray and Bohstedt (1948) have reported that pork from recently sprayed animals had "off" taste and odor.

255I. Four methods of defrosting poultry studied.

BEERY, I., PRUDENT, I., AND WILSON, E. D. *J. Home Econ., 41,* 203-4 (1949).

Methods used were: (1) standing loosely covered with wax paper in the refrigerator at 40° F. for approximately 20 hours or until an internal temperature of 4° C. was reached; (2) standing loosely covered at room temperature, 77° F. to 88° F., for about four hours or until an internal temperature of 4° C. was registered; (3) standing in warm water at 49° C., the volume of water being four times the weight of the frozen roaster, until the same internal temperature of 4° C. was obtained; (4) placed immediately in the roasting pan in an oven at 350° F. The choice of one of these methods of defrosting has little or no effect on the palatability factors of frozen roasters except for tenderness, and it makes little or no difference as far as cooking losses are concerned.

PECTIN—JAMS AND JELLIES

256I. The use of pectin hydrolysis in the processing of milk and whey.

MAASS, H. *Milchwissenschaft, 2,* 286-8 (1947). English, French and Russian summaries. *Nutr. Abstr. Rev. Vol. 18,* 37 (1948).

Attention is drawn to the fact that when sol. casein in milk or whey, or whey albumin, is in contact with calcium pectate, which is then submitted to the action of pectase, the pectate loses its effect as a protective colloid, and the protein is pptd. This is the basis of the effectiveness as protein precipitants of certain plant juices rich in pectase.

257I. Edible gelling composition containing Irish Moss extract, locust bean gum, and an edible salt.

BAKER, G. L. Assignor to Krim-Ko Corp. 2,466,145, April 5, 1949.

A composition containing in approximate proportion by weight of Irish Moss extract 50%, locust bean gum 33⅓%, and potassium chloride 16⅔%, said composition being capable of forming a strong and elastic gel solely by applying water and heat thereto sufficient to dissolve and disperse the ingredients and then cooling the same to gelling temperature, the gel product having strength and elasticity of greater magnitude than can be accounted for by the additive effects of the locust bean gum and the potassium chloride on the Irish Moss extract.

Book Review

INTRODUCTORY FOODS, by Osee Hughes, Ohio State University. The Macmillan Company, New York, N. Y., 1949. 575 pages. Price $4.25.

This is a revised edition of a book first published in 1940. As in the first edition the subject matter has been adjusted to the following present-day trends in the teaching of introductory food courses: (1) "Courses are being offered somewhat earlier than formerly (either in the Freshman year or early in the Sophomore year); (2) courses include little or no experimental work; (3) considerable use is being made of the demonstration method partly to replace experiments, partly as a time and energy saver in presenting fundamentals, and partly for the purpose of developing better food standards in students."

The sequence of chapters has been changed somewhat but, as the author states, there are so many ways of teaching foods that it is impossible to suggest a sequence suitable for all uses. The chapter on frosted foods has been brought forward for more convenient use in relation to the cookery of frozen fruits, vegetables and meats. The chapter on food preservation, which includes canning, freezing, drying, jelly-making and pickling, has been greatly enlarged. The number of illustrations has been increased with the idea of not only improving preparation procedures but also of developing higher standards for the finished products. More basic and type recipes have been included.

This edition like the first one is well organized and clearly written. It is interesting reading and has proved its worth as a text for introductory food courses during the nine years elapsing since the first edition.

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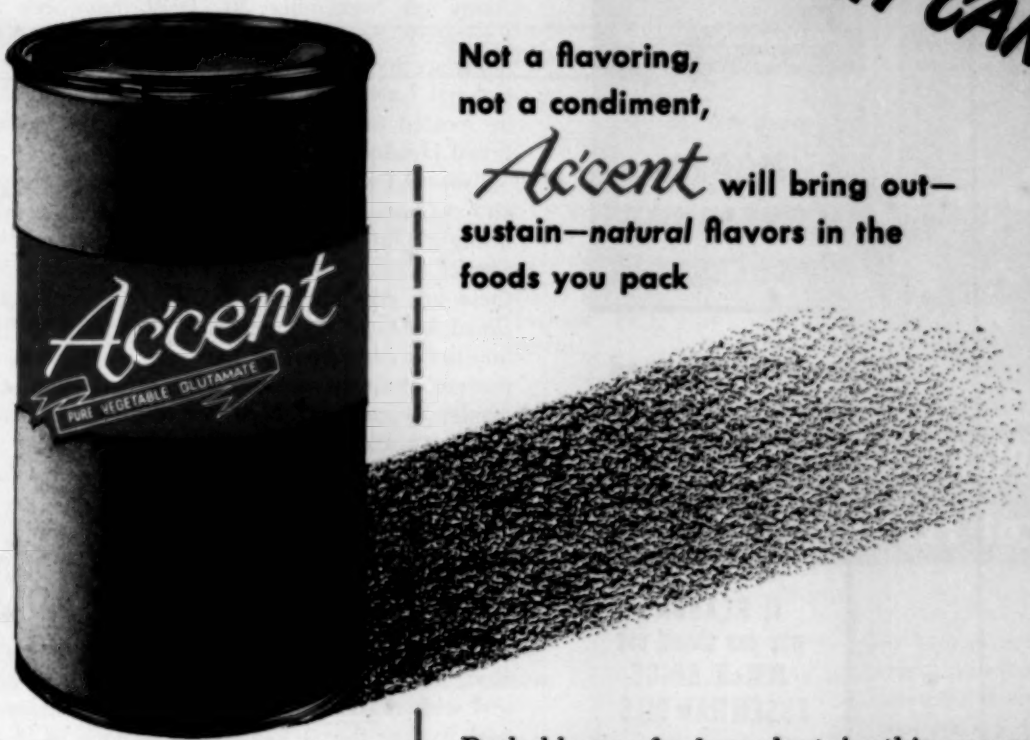

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